ARTICLES.

THE ARTIFICIAL HEART

Is it a Boon or a High-Tech Fix?

BARTON J. BERNSTEIN

On December 2, amid much journalistic fanfare, surgeons in Salt Lake City implanted an artificial heart in Barney Clark, a retired dentist suffering from irreversible heart damage and hovering near death. This was the third implant of an artificial heart in a human being and the first designed to be permanent. The operation has been heralded as the triumph of "heroic" medicine: skilled surgeons mobilizing high technology to extend, and possibly improve, human life.

The bloom of early enthusiasm wilted when Clark underwent two more operations—the first to stop air bubbles from forming in his lungs and the second to replace a broken part of the mechanical heart. A malfunction in the artificial heart that showed up during the original operation compelled surgeons to replace the left ventricle. Such problems remind us that the device is still experimental, and to describe it as "permanent" is a statement of hope, not reality. Also, it has no implantable power source, and therefore the recipient must be tethered by six-foot lines to a 350-pound console. Above all, important questions remain about the desirability of an artificial heart, the general emphasis on high technology in medicine and the current infatuation with heroic remedies.

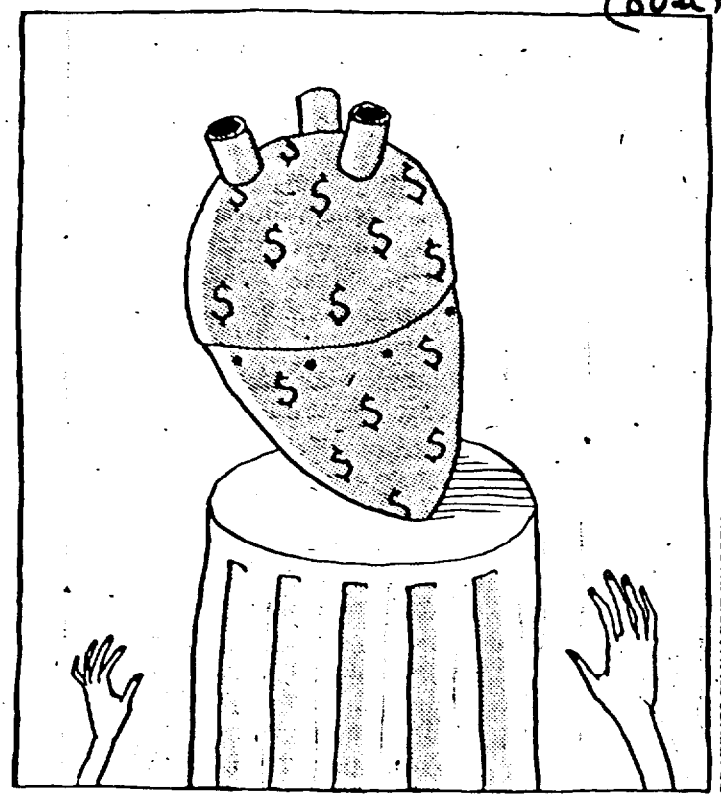
So far, however, there has been almost no public discussion of the issues involved. Congress has not adequately examined the Federally funded artificial-heart program since its inception eighteen years ago. There was little public debate at the time, and one key Federal official concealed his objections from Congress and the public. The press, for the most part, publicized the optimistic—even unrealistic—claims and ignored the early failures and setbacks.

Foremost among these issues is the matter of cost. Can America afford to develop a workable artificial heart? It has been estimated that the device, the operation and the hospital care would cost $100,000 per recipient in the first year after implantation. With projections of the number of recipients ranging from 16,000 to 66,000 each year, the total annual cost would run between $1.6 billion and $6.6 billion. At a time when the Federal budget is strained, when the deficit is approaching $200 billion and when many Federal health programs are being cut back, the nation cannot afford these additional expenditures.

Yet if the artificial heart is perfected and the government is unwilling to pay for the operations of all who need it, the device will be available only to the wealthy, who already receive better health care than the poor do. Whether a patient lives or dies would be based solely on his or her ability to pay—a situation which would pain many Americans and offend their sense of justice. It was the desire to avoid this unfairness that impelled the Federal government to fund all kidney dialysis treatments in the United States. In the case of the artificial heart, condemning to death those who cannot pay would be even more morally troubling, because only the wealthy would benefit from the $200 million Federally funded program that developed the device.

Federal funding of a massive artificial-heart program, with annual expenditures in the billions, would mean the continuing neglect of research on the prevention of heart disease, which would benefit more Americans. The government should provide more funding for research in other areas of preventive medicine—prenatal care and nutrition, for example.

Furthermore, there are serious doubts that the artificial heart will make the lives of heart patients significantly better if it should become widely available. Being tethered to air hoses may not be much better than being bedridden. The experience of dialysis patients is relevant here. They have a suicide rate that is eight times that of the general population; many of them are depressed and unable to work. And the promise of a power system that can be implanted remains just that—a promise. So far, the artificial-heart program has been riddled with unrealistic promises—about the scientific knowledge that will be gained and about the improved quality of life. Estimates of the cost



DRAWINGS BY VALERIE WARREN

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of the program and when it will reach its goal have consistently been overly optimistic.

Conceived in the early 1960s amid widespread euphoria, and promoted by leading heart surgeons and biotechnicians, the Federal program was supposed to cost $40 million and develop a *fully* implantable heart within five years. The first implant was to take place on February 14, 1970—Valentine's Day. Now, the program is more than a decade behind schedule and the total cost has soared 500 percent. Even the most optimistic proponents do not think there will be a fully implantable device until the end of the 1980s, at the earliest, and some experts close to the program think that goal will not be achieved for at least a generation.

When it first considered funding the program, Congress never heard from some highly placed government experts who opposed it. Dr. James Shannon, a cardiologist and the director of the National Institutes of Health, was one who privately resisted the program but publicly supported it. He deemed the program premature, correctly argued that the basic scientific problems (including the need for a safe, reliable, implantable power source) could not soon be solved and feared that massive funding for the artificial heart would distort research priorities. Wishing to avoid a public squabble with the program's powerful advocates, he did not convey his misgivings to the Congressional committee considering appropriations. Instead, he secured additional funding for other heart-research programs by telling gullible Congressmen that the artificial heart could be developed for even less money than Congress planned to appropriate.

In the upbeat mood of the early days, the medical experts also made unrealistic assessments of the risks and benefits of artificial hearts. They predicted that no one would die on the operating table, that no device would fail and that most patients would be able to resume working full time, adding $19 billion to the gross national product within a decade. The optimists disregarded the findings on dialysis patients and evaded fundamental questions about the wisdom of pursuing high-technology fixes for medical problems.

The artificial-heart program has been subjected to only perfunctory Congressional oversight. Budget requests are routinely approved after hearings lasting two hours on the average. Because the annual expenditures to develop the device have been relatively small (about $8 million to $10 million), and because most members of Congress have an almost blind faith in physicians and medical experts, there has been no inclination to challenge the program, to raise doubts about its future costs or to ask whether an artificial heart is even desirable.

With the artificial heart still in an experimental stage and a totally implantable device at least a decade away, now is the time for a probing public dialogue about the costs—economic and social—of developing this device. Admittedly, there is little glamour in preventive medicine. Sometimes its findings require us to reconsider the structure of our society and the injuries we quietly suffer in the name of economic necessity. That is why heroic medicine has often seemed more attractive. It does not prompt demands for social reform or for the elimination of hazards in the workplace, and it represents a triumph of skilled physicians and technology over illness and nature. But such triumphs can be costly and shortsighted.

The quest for the artificial heart should remind us that technology shapes our world, and our expectations and fears, in both dramatic and subtle ways. It should provoke us to ponder once more the larger questions: Who makes decisions about technological developments, especially when they are Federally funded? How should those decisions be made? Do the experts always know what is best? Or should the people also have a voice in the matter? □